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RESEARCH REPORT

THE USAFE AGGRESSOR F-16 TRANSITION

A TIME FOR CHANGE

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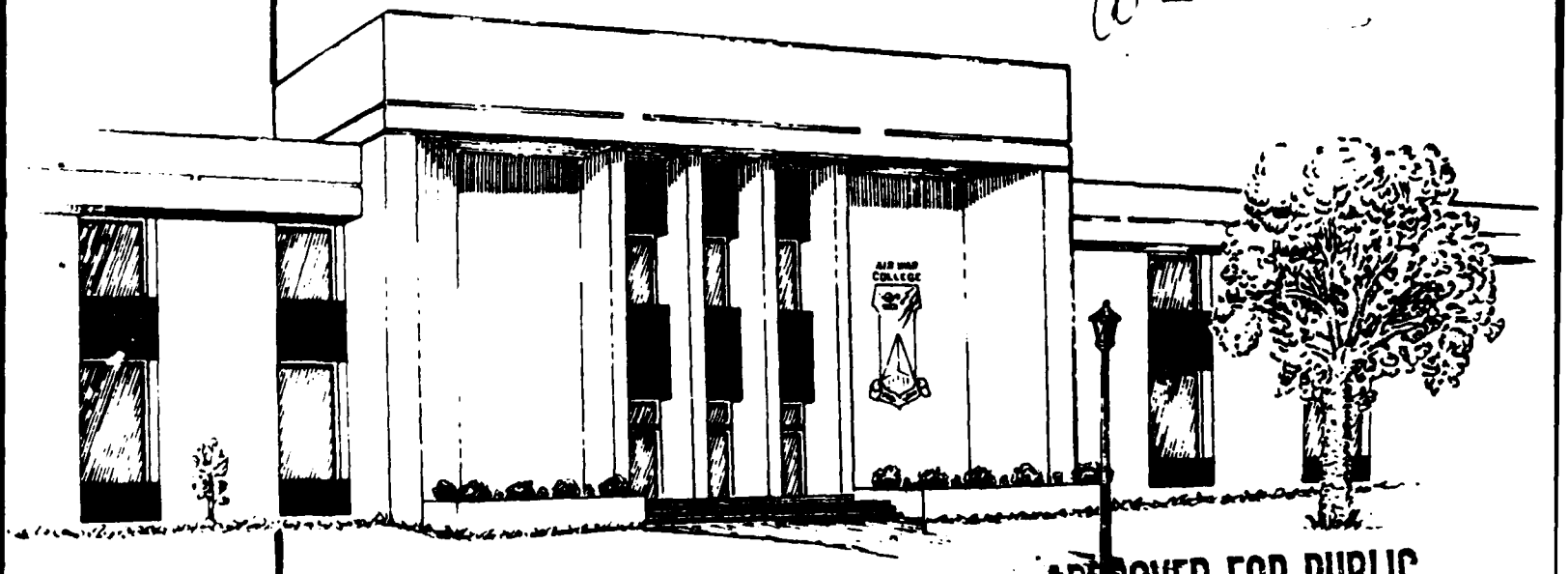

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THE USAFE AGGRESSOR F-16 TRANSITION

A TIME FOR CHANGE

by

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Lt Col, USAF

A DEFENSE ANALYTICAL STUDY SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE CURRICULUM

REQUIREMENT

Advisor: Colonel John M. Vickery

MAXWELL AIR FORCE BASE, ALABAMA

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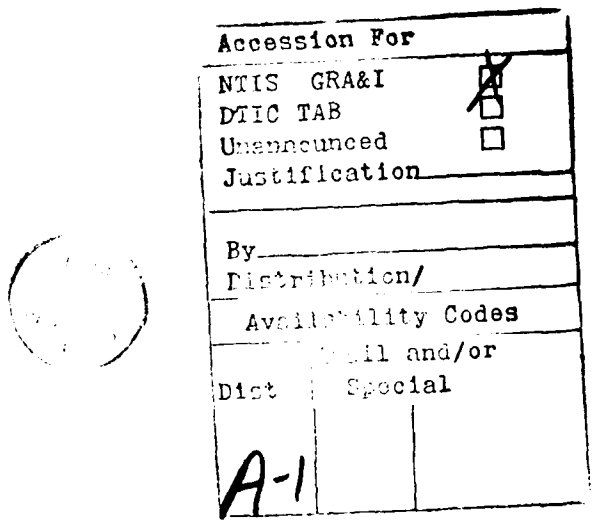

EXECUTIVE SUMMARY

TITLE: The USAFE Aggressor F-16 Transition - A Time For Change.

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Over the past twenty five years, the Soviet and Warsaw Pact air-to-air threat has undergone a significant growth and modernization. Improvements in fighter aircraft performance, air-to-air missiles, avionics performance, and composite force training, have markedly improved the threat to North Atlantic Treaty Organization (NATO) forces.

Aggressor training is vital to providing USAFE fighter crews with realistic, threat oriented aerial combat training. The Aggressor Squadron transition to the F-16 greatly improves their ability to emulate the threat, but some aspects of the training they can provide with the F-16 are woefully inadequate. A significant number of F-16's must be added to the unit before the Aggressors can even begin to provide a level of aerial combat training that resembles the Pact threat.

This study examines past Aggressor training with the F-5, compares that to current training with the F-16, and proposes some changes that should be made in order to improve the realism and productivity of Aggressor aerial combat training for USAFE aircrews.

BIOGRAPHICAL SKETCH

Lieutenant Colonel Richard O. Burroughs (Ed D., University of Southern California) has been interested in the readiness and warfighting capability of United States Air Forces Europe since he was assigned as Commander, 527th Aggressor Squadron, RAF Alconbury, England in 1986. He has traveled widely in Europe and watched the state of air-to-air training and combat readiness in the units for which his squadron provided training. Prior to the assignment with the 527th, Colonel Burroughs also had two assignments with the 26th Aggressor Squadron at Clark AB in the Philippines. He split those assignments with a tour as Chief, Fighter Operations Division, Headquarters PACAF, Hickam AFB, Hawaii. Before that, he flew the A-7D at England AFB, Lousianna for just over four years. Prior to that, he flew the T-28 and AT-28 at assignments in Thailand and at Keesler AFB, MS. His professional military education includes: Squadron Officers School, Air Command and Staff College, the National Security Management Course and the Air War College class of 1989.

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THE AGGRESSOR PROGRAM

Introduction

The purpose of this study is to analyze the effects of the Aggressor F-16 transition on Aggressor air-to-air training provided to United States Air Forces Europe (USAFE) aircrews. I will begin with a look at the historical development of the Aggressor program in general. Next, I will examine 527th Aggressor Squadron and its' unique aspects which change, to one degree or another, with the F-16 transition. Then I will examine the Aggressor F-16 program and compare the same program aspects with those discussed in the F-5 section. This section will focus on what is happening during the transition, and what is projected for future Aggressor operations with the F-16. The comparison of F-5 and F-16 programs will examine the effects of the transition on Aggressor air-to-air training in USAFE. The last section will provide some proposed changes to F-16 program elements in order to improve Aggressor air-to-air training for USAFE pilots.

History

The Aggressor program has its origin in the Vietnam era where, despite superior equipment, U.S. fighter pilots

sustained excessive losses in their aerial engagements with the North Vietnamese Air Force. A comparison of USAF kill ratios during the Vietnam war with those of the Korean conflict showed a disturbing decrease from over 10 to 1 in Korea to a meager 1.1 to 1 in Vietnam. To determine the cause of this poor performance and recommend changes that would improve fighter pilot skills, the USAF initiated a comprehensive study called "Operation Red Baron". This study analyzed USAF aerial combat engagements in Vietnam, in detail, and published a 1972 report that outlined three main observations and recommendations. (1:3-4)

First, during the majority of aerial engagements, the USAF pilot did not see the attacking enemy aircraft before he fired ordnance. This was a surprising finding, and the implications were very serious, since most other Communist countries, at that time, also flew the small, difficult to see, Mig-21 aircraft. This problem had not occured in the Korean war primarily because both the friendly and enemy aircraft were of similar size and USAF pilots were used to looking for small "bandits". In the engagements of that war, the victor was determined by the aerial combat skills of the individual pilot, since the Mig-15 and F-86 were similar in size and performance. However, in Vietnam, USAF pilots had only trained against other F-4's before going to combat, and the difficulties

they experienced in fighting the small, better turning Mig-21 were indeed serious. (2:4-5)

The second observation of the "Red Baron" report was that USAF aircrews lacked any detailed knowledge of the enemy. They knew little about enemy pilots, his aircraft, or his tactics. Although the information was readily available within the intelligence community, there was no established forum for presenting that information to the aircrews. (3:5)

Third, the study found that USAF aircrews had been trained to fight the wrong war. Training was geared primarily for a 1950's close air support type activity, and it assumed air superiority was a given. However, much had changed since the Korean war, and the study highlighted the USAF failure to train pilots against a realistic, dissimilar, air-to-air threat. As a result, USAF aircrews in Vietnam were learning how to fight aerial combat the hard way--through on-the-job training. (4:5)

To satisfy the recommendations of the "Red Baron" report, the USAF established a small group of experienced fighter pilots and aircraft at Nellis Air Force Base, Nevada, to support Tactical Air Command (TAC) Dissimilar Air Combat Training. This was the meager beginning of what was to become known as the Aggressor program and the 64th Fighter Weapons Squadron (FWS). (5:6)

Not having actual Migs to fly, the 64th FWS was initially equipped with the Northrop T-38 Talon, an aircraft both similar in size and performance to the Mig-21. To further simulate the threat, the aircraft were camouflaged in paint schemes representative of the potential enemies. (6:31)

The success of the 64th FWS was such that in 1975 a second squadron, the 65th FWS was formed at Nellis to further fulfill the training needs of the Tactical Air Command. This expansion was closely followed by the addition of two overseas squadrons, the 26th Tactical Fighter Training Squadron (TFTS) at Clark Air Base in the Philippines, and the 527th TFTS at Royal Air Force Alconbury in England. These two squadrons were formed to meet the continuing training needs of the forward deployed fighter forces stationed in the Pacific and Europe. (7:6) By 1976, the Aggressor squadrons had been equipped with the Northrop F-5E, an aircraft that was much better suited to the role of simulating the performance and avionics capabilities of the Mig-21. (8:48)

Mission

Although assigned to different commands, all of the Aggressor squadrons had the same mission--to provide realistic, dissimilar air-to-air training and threat

knowledge to USAF and allied forces, with priority given to USAF air-to-air fighter units. That mission is accomplished by the four Aggressor squadrons through a series of deployments, throughout the year, in which a wide variety of flying and academic training is accomplished. In USAFE, the scheduling of those deployments is centrally managed at Headquarters USAFE, at Ramstein Air Base, Germany. The USAFE Fighter Training Division (USAFE/DOOT) develops, in coordination with the divisions that schedule exercises and inspections, a master deployment schedule, for each six month period, that allocates Aggressor sorties among the various USAFE fighter units. Priority is given to the units with an air-to-air Designated Operational Capability (DOC), and annual Aggressor sortie production capability determines what other units will be given Aggressor sorties throughout the year.

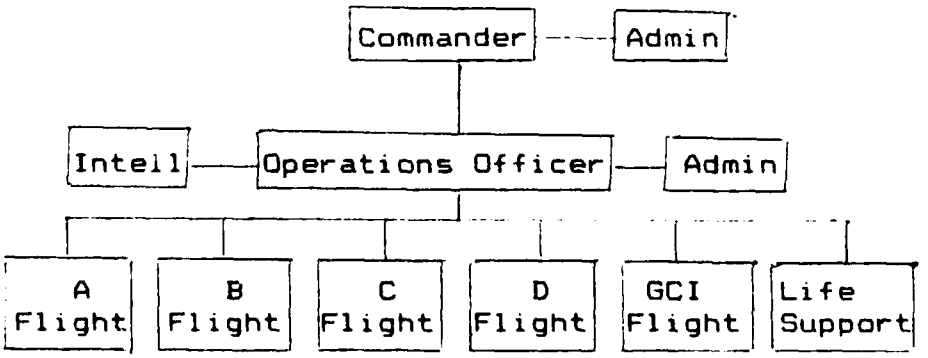
Organization

Table One below shows the organizational structure of the 527th Aggressor Squadron in 1987. With the F-16 transition in 1988, the basic structure of the squadron remains about the same, but the number of personnel assigned has decreased slightly. The organization is not significant to the operations or deployment scheduling of the squadron, but it is shown here merely to give the reader a better idea

of the unit's composition. Under the 1987 organization, the unit was manned with approximately 51 people, including 25 pilots, 11 Ground Control Intercept (GCI) controllers, 2 intelligence specialists, 6 life support technicians and 7 adminsitrative personnel. The maintenance organization included a total of 18 F-5E aircraft, of which approximately 60 percent, or 11 aircraft on the average, were provided for daily flying operations. With the transition to the F-16, the number of aircraft was reduced to 12, and the number of personnel assigned to the 527th Aggressor Squadron was reduced to include 16 pilots, 5 GCI controllers, 2 intelligence specialists, 4 life support technicians and 4 administrative personnel. The basic organizational framework, however remains the same today.

Table One

527th Aggressor Squadron Organization



CHAPTER II

THE AGGRESSOR F-5 PROGRAM

The 527th Aggressor Squadron (AS) has a unique mission in Europe. During each of the past 12 years, the squadron used its' 18 aircraft and 50 personnel to fly between 5,000 and 6,000 sorties at locations ranging from Norway, on the Northern tier of Europe, to Turkey in the South. While they provided small flying and academic deployments to an average of more than 10 countries each year, they also maintained a continuous presence, with approximately one-third of the squadron at any given time, at Decimomannau Air Base, Italy. To provide a more indepth look at the squadron's operations, I will examine several aspects of the unit's annual flying program. I have chosen to examine the categories of sortie production, scenario design, deployments and exercises because they represent the aspects of the flying program that have changed the most with the transition to the F-16.

Sortie Production Capability

Table Two shows the annual sortie production for the 527th Aggressor Squadron, from 1977-1988. This Table is used to give a historical perspective of the total F-5E sortie production capability. That data will be used to

compare the F-5E total for 1987 with the current F-16 sortie production capability described in Chapter IV. Note the decrease in sortie production from the high in 1981 to that in 1987. The general decrease in sortie production, over the period, was due mostly to the age and increasing maintenance requirements for the F-5's. The annual flying hour program is determined by an agreement of the Operations and Logistics Directorates at USAFE Headquarters. I have chosen to analyze the 1987 figures in greater detail in order to provide a framework for comparison with the current F-16 program. For 1987, the 5,280 sortie figure was reached by multiplying the number of possessed aircraft (16), times the Utilization (UTE) rate (27.5), times the number of months (12). Therefore, 16 * 27.5 * 12 = 5,280 sorties. Possessed aircraft is defined as the average number of aircraft assigned minus the number allocated to another status, usually maintenance deferred, that is available for flight operations. The possessed aircraft figure is used in calculating the annual flying hour program numbers. Although the assigned versus possessed figures can be the same, the possessed figure is generally 1-2 aircraft less for this size operation, on the average.

Table Two

527th Aggressor Squadron - Annual Sortie Totals

Year	Sorties	Year	Sorties
1977	5221	1983	5810
1978	5423	1984	5209
1979	5525	1985	5462
1980	5755	1986	5390
1981	5971	1987	5280
1982	5906	1988	1853 *

* First six months only

Table Three provides another breakout of the 1987 Aggressor sortie total, shown in terms of total Dissimilar Air Combat Training sorties provided to the various USAFE and NATO units. Sorties per pilot are shown in the last column of this Table. To determine sorties per pilot, I have assumed the typical fighter squadron contains 33 mission ready pilots. I determined that figure by multiplying the typical number of jets assigned (24) by the established USAF crew ratio (1.25) and then added a percentage of the Wing overhead (3). While that number may not be totally accurate in every case, it is close enough to provide a representative comparison between units. However, since Soesterburg is a one squadron operation, I have used a total of 40 pilots, vice 33, due to the large number of mission ready overhead staff assigned. Sorties per pilot are annual totals.

Table Three

1987 Aggressor DACT Sorties Provided to USAFE/NATO Units

Aircraft	Mission	Base	Sortie Total	Pct of Total	Sorties per Pilot
F-15	A-A *	Bitburg	1896	45.9	18.9
F-15	A-A	Soesterburg	658	15.9.	16.5
F-16	A-A	Ramstein	224	5.4	2.2
F-16	A-G	Hahn	276	6.7	2.7
F-16	A-G	Torrejon	492	11.9	4.9
F-4G	Wsl	Spangdahlem	164	4.0	3.4
ALL	USAFE	All Other	14	0.3	
ALL	NATO	All Other	410	9.9	
			-----	-----	
		Totals	4134	100.0	

* A-A means Air-to-air primary DOC
A-G means Air-to-ground primary DOC
Wsl means Defense Suppression primary DOC

Essentially no Aggressor sorties were provided to USAFE A-10, F-111 or RF-4 units because of the limited sortie production capability of the F-5E and the USAFE/DOOT established sortie allocation priorities.

You will note that Table Three only accounts for 4,134 of the 5,280 Aggressor sorties flown in 1987. The remaining 1,100 sorties were flown in what I will categorize as 527th "In House" requirements, such as functional check flights (FCF), instrument sorties,

deployment sorties, (ROTE), and similar (F-5 versus F-5) upgrade and continuation training. A breakout of those "In House" sorties is shown in Table Four.

Table Four

527th Aggressor Squadron "In House" Sortie Distribution

Mission Type	Sortie Totals
Similar	598
Instrument	28
ROTE	405
FCF	53
Other	27
Total	1111

While 1987 was chosen as a representative year, the percentage of "In House" sorties has remained relatively constant over the past few years. One number of significance is the 598 sorties flown in the Similar category. While a small number of these sorties are required to provide 527th required check flights and upgrade training, the vast majority of the sorties flown in this category were caused by a lack of adversary with whom to fly. To some extent, this high number is a function of bad weather at the adversary's base, but it is also caused by the F-5 basing at RAF Alconbury. Not being co-located with

a unit that could productively use the "In House" sorties traditionally caused a fair amount of DACT to be lost. Like all other units, the 527th has an annual flying hour program, established by USAFE headquarters, that specifies the number of sorties and hours it must fly. In large part, the number of DACT sorties, described as lost earlier, are caused by the 527th having to ocassionally fly sorties to meet it's flying hour program at the expense of providing valuable DACT to other USAFE units. At least another 400 sorties could have been added to the 1987 total of more than 4,000 Aggressor DACT sorties, provided to USAFE aircrews, by having had more flexibility in the management of the sorties flown out of the home station, or by having had the Aggressors co-located with a USAFE unit that could have effectively used those sorties.

Training Scenarios

In examining DACT provided to USAFE units by the 527th, I believe it is worthwhile to look at the various types of scenarios that are flown during that training. In describing scenarios, the USAFE unit number is put ahead of the Aggressor number. For example, a 2v1 against Bitburg F-15's means that 2 Bitburg F-15 pilots flew against 1 Aggressor in the scenar o described. I will briefly define most of the scenarios that units have flown against

the Aggressors, from 1v1 to 4vX, in terms of the kind of training the Aggressors could provide in each of the scenarios. I include these definitions to show the various scenarios against which USAFE aircrews can fly outnumbered or practice various other aerial combat skills. These scenario definitions are not meant to be all encompassing or absolute. They merely show some of the types of training being received by USAFE aircrews when they fly with the 527th.

1v1 - Dissimilar Basic Fighter Maneuver (DBFM) practice against a small, hard to see threat simulator. Good for F-15 pilots in learning to judge such things as range, aspect, closure, energy and performance of a smaller, less capable aircraft like the F-5.

2v1 - Two ship Dissimilar Air Combat Maneuvering (DACM) practice against one small, highly maneuverable bandit. Especially good for developing 2 ship coordination skills, and learning engaged/free fighter responsibilities, against an aircraft that can accurately simulate the older model Soviet aircraft.

2v2 - Dissimilar Air Combat Training (DACT) practice against basic Soviet/Warsaw Pact formations and tactics.

3v2 - DACT practice for a 3 shi, formation against the basic 2 ship Soviet/ Pact formations and tactics.

4v2 - Same as 3v2, except now learning how to fight as a four ship against 2 ship Soviet/Warsaw Pact tactics.

4v3 - Four ship DACT against 3 element Soviet formations and tactics. This is the first scenario where Aggressors can simulate the number of elements in the prefered Soviet fighting formation. Three separate entities are significantly more difficult to target, sort, shoot and survive against than two, but should prove to be relatively easy with good coordination of the 4 ship.

4v4 - Same as above except the Aggressor can simulate one element including two aircraft or as many as four separate elements. Particularly good for teaching F-15/F-16 pilots how to target, sort and shoot both aircraft in one attacking element.

1v2 - Particularly good for practicing DBFM skills against two small, difficult to see, and highly maneuverable bandits.

2v3 - Good for the basic practice of fighting outnumbered. Keeping track of 3 Aggressor aircraft, executing a basic Soviet tactic, can be very difficult, unless practiced regularly.

2v4 - An interesting mission and a real challenge to most aircrews. Very difficult to keep track of 4 aircraft, or three elements, executing Soviet tactics. Post merge survival is the most difficult part of this scenario, unless

you have managed to "kill" all of the F-5's pre-merge.

2vX - Probably the most challenging of all the scenarios described in this section. Aggressors generally fly 5-6 aircraft in this scenario, and killing all the bandits, or surviving the merge if you haven't, is a major challenge for most F-15/F-16 pilots.

3v4 - Another difficult challenge. Most units rarely practice fighting with a three ship element, so coordination of the flight is especially difficult, particularly against as many as 4 separate targets.

3vX - Basic 3 ship DACT against complex Soviet formations and tactics. Coordination and control of the 3 ship flight can be difficult to learn, and this is an excellent scenario for practicing 3 ship control against a wide variety of Soviet tactics.

4vX - The most challenging of the DACT scenarios. Aggressors can provide, with 5 or 6 aircraft, the most complex of known Soviet formations and tactics. While not outnumbered by the same ratios they might face in Central Europe today, this scenario provides most F-15 pilots with a considerable challenge.

Table Five shows a breakout of Aggressor DACT sorties flown by scenario type. This data shows, for a representative year, the type of training that has been accomplished with the Aggressors. It also gives us a

picture of how USAFE units are using Aggressor DACT to prepare to meet the Soviet/Warsaw Pact threat. Sorties in Table Five are shown with the USAFE unit listed before that of the 527th. You will note from Table Five that the number of sorties flown in scenarios where fighters from USAFE units equaled or outnumbered the Aggressors totaled 2,433, while the total for scenarios in which they fought outnumbered was 1,701. That means that USAFE aircrews fought outnumbered in only 41.2 percent of the total 4,134 Aggressor DACT sorties provided to them. The number of sorties flown outnumbered is not subdivided by unit (F-15, F-16, etc), so it is not possible to determine which units have flown exactly which scenarios. However, from my personal experience as the 527th Aggressor Squadron Commander, I know that, except for the 4vX scenario, the number of scenarios flown outnumbered, by USAFE fighter units, is not significantly higher for the two F-15 wings than it is for the USAFE F-16 units. My point here is that USAFE F-15 pilots flew outnumbered in only about half of the scenarios they flew with the Aggressors. In my mind, this is significant because it points out that USAFE F-15 pilots are not training like they plan to fight. To counter the Soviet Warsaw Pact threat of today, I believe USAFE air-to-air pilots need to devote a significantly larger portion of their training with Aggressors to those scenarios in which they fight outnumbered.

Table Five

1987 Aggressor DACT Totals

Sortie Type	Sortie Total	Pct of Total	Sortie Type	Sortie Total	Pct of Total
1v1	184	4.4	1v2	17	0.4
2v1	236	5.7	2v3	450	10.8
2v2	1470	35.6	2v4	206	4.9
3v2	4	0.1	2vX *	65	1.5
4v2	37	0.9	3v4	12	0.3
4v3	87	2.1	3vX *	12	0.3
4v4	415	10.0	4vX *	939	22.7
	----	----		----	----
Total	2433	58.8	Total	1701	41.2

DACT Grand Total = 4134

* X means > 4, and here generally means 5 or 6.

Deployments

With the F-5E, the 527th Aggressor Squadron was able to provide two different types of deployment packages that could support the various training objectives of USAFE units. Considering the many relevant factors, such as aircraft availability, F-5E maintenance requirements, USAFE aircrew training requirements, etc., the F-5E deployment program basically evolved into packages of two sizes, one including six aircraft and one with three.

The six aircraft package was used to support training at Decimomannau, Italy. This package consisted of 6 F-5E's, flown by 7 or 8 pilots and supported with 2 GCI controllers and about 20 maintenance personnel. Based on training time and ramp space available, this package was deployed to Decimomannau about 48 weeks of every year. Two aircraft and all pilots and controllers were exchanged every two weeks in order to even out flying time for the F-5's and flying/deployed time for the pilots and controllers. Since 60 percent of all 527th flying occured at Decimomannau, it was necessary to swap pilots and controllers every two weeks in order to maintain a similar level of proficiency among all pilots and controllers assigned to the unit. Maintenance personnel were swapped out about once a month to balance deployment time among their people.

The second type of deployment package was called the "Road Show" package. It consisted of three aircraft, 4 pilots, 1-2 controllers and 7-8 maintenance personnel. (9:413) Based on maintenance requirements for the F-5E, this package was deployed no more than a total of 26 weeks a year, generally in one week blocks to locations scheduled by USAFE/DOOT. This package proved to be very beneficial in supporting training for a unit that needed the basic DACT scenarios, i.e. 1v1 up to 2v2 and sometimes 2v3. Spread equitably across USAFE, this deployment package could nicely

support the small scenario end of the training spectrum, while the package at Decimomannau supported the larger scenario requirements of the units while they were deployed to Decimomannau.

A typical Road Show deployment schedule is shown below in Table Six. It shows a by unit distribution of the 26 weeks of Road Show activity for 1987.

Table Six

1987 Aggressor Road Show Distribution

Location	Weeks	Pct of Total
Bitburg	12	46.2
Ramstein	2	7.7
Hahn	3	11.5
Torrejon	3	11.5
Spangdahlem	2	7.7
Zaragosa	4	15.4 *
	---	-----
Total	26	100.0

* Training at Zaragosa was given mostly to units from Spangdahlem and Torrejon.

When both Decimomannau and Road Show packages were deployed, the 527th also scheduled an additional 2 F-5E's tc fly 6 sorties a day at home. Most sorties were flown

against the Bitburg or Soesterburg F-15 units either in scenarios that originated, for both participants, from RAF Alconbury or in scenarios in which adversaries took off from their own base and met in the Aggressor training area. During weeks when a Road Show deployment was not planned, the 527th scheduled 4 F-5's for 12 sorties a day generally also against the Bitburg and Soesterburg units. During these weeks, DACT, in scenarios up to 4v4, was provided to Bitburg and Soesterburg again in scenarios where they flew either from RAF Alconbury or their home stations.

The sortie production capability, coupled with the total number of F-5's available to fly, gave the Aggressors the flexibility to provide a wide range of DACT, in widely varied scenario sizes, at up to three locations simultaneously. The keys to that flexibility were the number of aircraft assigned and the sortie production capability reflected in the high UTE rate of the F-5. A lesser number of jets, or smaller sortie production capability, would have severly hampered that flexibility in the training of USAFE aircrews.

Academic training was provided through a series of 37 Aggressor academic briefings, constantly updated by the squadron's pilots, intelligence personnel, and GCI controllers. In an average year, these briefi.gs were typically given to more than 5,000 personnel from about

11-12 allied European countries. Due to scheduling constraints at Decimomannau, academic training was normally conducted in conjunction with Road Show deployments vice at Decimomannau.

Exercises

From 1980 through 1987, the 527th also sponsored a complex air-to-air training exercise, with the F-5E, called Red Star. Conducted at RAF Alconbury, the purpose of this exercise was to provide selected F-15 pilots, from the Bitburg or Soesterburg units, with the opportunity to conduct outnumbered DACT scenarios against a large number of F-5 adversaries. Since the vast majority of normal Aggressor training is conducted in scenarios at the level of 4v4 or smaller, this exercise gave these selected USAFE pilots the chance to practice DACT in scenarios where they were outnumbered to the degree they might actually have to face in Central Europe. By the manner in which it was conducted, exercise Red Star provided the largest dedicated air-to-air training in USAFE. A typical, week long exercise provided one squadron of the Soesterburg or Bitburg wings with the opportunity to fly the scenarios outlined in Table Seven on the next page:

Table Seven

Exercise Red Star Schedule

Day	Time	Scenario Size	Remarks
Monday	0800	4v6	No other players
	1100	4v6	" " "
	1400	4v6	" " "
Tuesday	0800	4v8	No other players
	1100	4v8	" " "
	1400	4v8	" " "
Wednesday	0800	4v6+4	4 Added strikers
	1100	4v6+4	" " "
	1400	4v6+4	" " "
Thursday	0800	4v8+4	4 Added strikers
	1100	4v8+4	" " "
	1400	4v8+4	" " "

Friday - Weather backup and exercise debrief day.

Scenarios that had added players utilized other USAFE assets, such as F-111's or RF-4's, to provide realistic Soviet style strike formations in the scenarios. Each day, three separate groups of F-15 pilots flew against the same Soviet style formations and tactics. In addition to individual flight debriefings, all players assembled at the end of each day for an overall debriefing of each flight, from both Blue and Red perspectives. From 1980 through 1986, only one, two week long exercise was conducted each year, thereby giving only two of USAFE's four F-15 squadrons a chance to participate in this valuable training. In 1987,

the 527th conducted this exercise twice, thereby giving each F-15 squadron the opportunity to send 12 pilots to RAF Alconbury for this training. Exercise Red Star was USAFE's most comprehensive air-to-air training exercise, and every after action report noted its' value. With the Aggressor F-16 transition, Red Star has, at least temporarily, disappeared, due in part to the transition, but mostly due to budget constraints on the FY 88 and FY 89 USAFE exercise budgets.

Having looked at the Aggressor F-5 program in detail, I will now turn my attention to an examination of the Aggressor F-16 program. In the next two sections, I will examine some overall factors that have changed and focus attention on a comparison of the various program elements between the F-5 and F-16 programs.

CHAPTER III

WHAT HAS CHANGED

The Threat

Important and significant changes have occured in the Soviet and Warsaw Pact Air Forces over the last few years. While they continue to outnumber NATO forces, just as they have for the last 30 years, they have made significant improvements in aircraft and missile technology. In the last ten years, they have replaced the majority of their older Mig-21 type aircraft with several modern, high performance fighters, including the Mig-23, Mig-25, Mig-29, Mig-31 and Su-27, to name only a few. Performance characteristics of these fighters is nearly equal to that of our most modern U.S. aircraft like the F-15 and F-16. Improvements in avionics and missile performance, to include look down, shoot down capability, has negated many of the advantages once enjoyed by USAF fighters. Finally, Soviet and Warsaw Pact training in large scale scenarios, while not as extensive as ours, has dramatically improved in recent years. All in all, I think it's fair to say that the once ill equipped and poorly trained Soviet and Warsaw Pact Air Forces now have capabilities that nearly equal ours in terms of both equipment and training. Soviet and Warsaw Pact Air Forces are now highly trained, and they have begun to orient

their strategy toward complex offensive operations in support of the extensive Soviet and Warsaw Pact ground forces.

The Aggressor F-16 Transition

When the Aggressor program began in the early 1970's, the F-5E was a logical choice of aircraft to simulate the threat because the F-5 closely resembled the Mig-21 in size and shape, as well as in performance and avionics capabilities. However, with the introduction of the Mig-23, Mig 25, Mig-29, Mig-31, and SU-27, the F-5 lagged grossly behind in its' ability to accurately simulate enemy aircraft size, performance and avionics capabilities. While several conferences were held in the last seven years to discuss the possibilities of a follow-on Aggressor aircraft, the main outcome of these conferences was simply to offer the Air Force leadership some broad key options. Realizing that Aggressor aircraft funding would compete with many other higher priority projects, conference members always realized that replacement of the F-5 would be unlikely (10:10) However, in the early spring of 1988, when the worldwide F-5E fleet was suffering from a serious problem of cracked main fuselage spars, the Air Force leadership suddenly brought the conversion to a top burner. USAFE led the way by implementing a plan to completely

transition the 527th to a total of 12 F-16C model aircraft between July and December of 1988. That transition is now complete, and the 527th organizational structure has changed slightly to accomodate its' smaller size.

The Organization

Key organizational structure for the 527th remains the same as it was with the F-5E. The major changes occured in the personnel strength of pilots and GCI controllers assigned, with the squadron drawing down from 25 pilots to 16 and from 11 down to 5 GCI controllers. Other personnel sections of the squadron remained about the same size. Having only 12 F-16 aircraft, and flying them at a 20 UTE rate vice the 27.5 UTE rate flown with the F-5 has caused the 527th's annual F-16 flying hour program to be considerably smaller than it was with the F-5. This caused a commensurate impact on the number of Aggressor sorties available for training USAFE fighter pilots.

Basing

While two A-10 squadrons from RAF Bentwaters were being moved to RAF Alconbury during this same time period, USAFE decided to move the Aggressor Squadron to RAF Bentwaters to even out the base loading at both bases. Basing the 527th at RAF Bentwaters may not be the most

effective option, in terms of sortie production efficiency and DACT allocation, so some other possible basing options will also be discussed in the following Chapter.

CHAPTER IV

THE AGGRESSOR F-16 PROGRAM

The 527th Aggressor's transition to the F-16 has brought about many changes in DACT they provide to USAFE units. These changes include first a significant reduction in their sortie production capability, compared to their sortie production capability with the F-5E. Second, their ability to generate the larger training scenarios described in Chapter II has been greatly reduced, at least for the present time. Third, the deployment schedule has been considerably reduced, to include only four ship deployments to Decimomannau in the last six months of FY 89 and no Road Show deployments for the entire fiscal year. Lastly, exercise Red Star was eliminated both because of fiscal constraints in the USAFE exercise budget and the inability of the Aggressors to generate the type of training required to prepare F-15 pilots for participation in it.

Impact of Reduced Sortie Generation

The Aggressor's 1989 flying hour program includes a total of 2,574 sorties, down by a significant degree from the 5,280 flown in 1987 with the F-5E. The 1988 program is excluded from this study because it was a year of transition and sortie totals are not representative of either program's

capabilities. Just as in previous years with the F-5, the 1989 F-16 program was designed by the Operations and Logistics Directorates at USAFE headquarters. Two factors are key in the 50 percent reduction in DACT that can now be provided with the F-16. First is the reduction in number of assigned aircraft from 18 F-5's to 12 F-16's. The second key is UTE rate flown with those aircraft. While the 1989 UTE rate is programmed to level off at 20 for the last six months of the year, the average FY 89 UTE rate is 17.8, down from the 27.5 flown by the F-5's in 1987. While F-16 UTE rates are expected to climb to something between 22-24 in the next few years, it is notable that total sortie production capability, for any currently possible F-16 UTE rate, is 50 percent lower than that available with the F-5.

To more effectively highlight the training problems caused by the sortie reduction, I believe it is useful to briefly discuss the air-to-air training requirements outlined in Major Command Manual (MCM) 51-50, the "bible" for tactical fighter aircrew training. In an average F-15 or F-16 squadron with an air-to-air DOC, and flying their pilots at Graduated Combat Capability level B, the typical F-15 or F-16 pilot would get a total of about 150 sorties per year. Of that total, MCM 51-50 says he should get 112 sorties dedicated to air-to-air training and it suggests that 50 percent of those sorties be flown against a

dissimilar adversary. (11:18) It also suggests that out of those 112 aerial combat sorties, pilots who fly in units with an air-to-air DOC should fly 16 sorties against the Aggressors while pilots in units with an air-to-ground DOC should fly 8 air-to-air sorties with the Aggressors. (12:A-1-3) Table Eight below shows, for USAFE fighter units, the total sortie requirements, for Aggressor DACT, using the sortie goals suggested in MCM 51-50.

Option One in Table Eight outlines the total Aggressor sorties required for each air-to-air pilot to get the suggested 16 sorties per year per pilot, while air-to-ground pilots get the suggested 8 Aggressor sorties per pilot per year. While USAFE A-10 and F-111 pilots certainly fall in the air-to-ground category, they have been excluded from this option because USAFE has said, for some time, that pilots in these units will not be allocated Aggressor sorties due to the limited sortie production capability of the 527th. Note the total of 6,240 sorties required is significantly larger than the total of 4,134 DACT sorties provided by the Aggressor F-5 program in 1987.

Option Two in Table Eight shows an equitable distribution of DACT sorties which is closely aligned with the FY 87 sortie production capability of the Aggressor Squadron flying the F-5. Note that this Option shows sorties per pilot totals that approximate the actual sorties

per pilot totals shown in Table Three.

Options Three and Four show sortie distribution options that are likely to occur with the current F-16 sortie production capability. While Option Three distributes sorties to all of the primary air-to-air and air-to-ground units, Option Four shows a distribution of sorties to only the primary air-to-air units. Option Four is likely what will occur in the FY 89 flying program because the 527th's F-16 sortie production capability is very limited and the squadron's ability to deploy severely restricted.

TABLE EIGHT

AGGRESSOR SORTIE DISTRIBUTION OPTIONS

				OPTION 1		OPTION 2		OPTION 3		OPTION 4	
WING	# SQDNS	# JETS	# PILOTS	SORTIES/ PILOT/ YEAR	TOTAL SORT REQ'D	SORTIES/ PILOT/ YEAR	TOTAL SORT REQ'D	SORTIES/ PILOT/ YEAR	TOTAL SORT REQ'D	SORTIES/ PILOT/ YEAR	TOTAL SORT REQ'D
BITBURG	3	72	100	16	1600	16	1600	14	1400	8	800
SOESTERBURG	1	24	40	16	640	16	640	16	640	8	320
RAMSTEIN	3	72	100	16	1600	8	800	2	200	5	500
HAHN	3	72	100	8	800	6	600	0	0	4	400
TORREJON	3	72	100	8	800	5	500	0	0	4	400
SPANGDAHLEM	2	72	100	8	800	0	0	0	0	0	0
ALCONBURY	2	36	50	0	0	0	0	0	0	0	0
BENTWATERS	4	72	100	0	0	0	0	0	0	0	0
IWEIBRUCKEN	1	18	25	0	0	0	0	0	0	0	0
LAKENHEATH	3	72	100	0	0	0	0	0	0	0	0
UPPER HEYFORD	3	72	100	0	0	0	0	0	0	0	0
TOT	28	654	915	72	6240	51	4140	34	2440	29	2420

Option 1 - MCM 51-50 suggested sortie totals
Option 2 - A total close to FY 87 F-5 sortie production
Option 3 - One method of distributing 2,500 F-16 sorties
Option 4 - A second option for distributing F-16 sorties in FY 89

Table Nine below shows the FY 87 F-5 sortie production capability, the FY 89 F-16 sortie production capability, the proposed FY 90 F-16 sortie production program, optional F-16 sortie production programs designed to show ways to achieve sortie production parity with past F-5 programs, and optional F-16 sortie production programs designed to show ways to meet MCM 51-50 suggested training levels, as described in Table Eight.

Table Nine

FY 87 F-5 Sortie Production Program

Type	Aircraft Assigned	Aircraft Possessed	UTE Rate	Sorties Per Month	Sorties Per Year
F-5E	18	16	27.5	440	5,280

FY 89 F-16 Sortie Production Program

Type	Aircraft Assigned	Aircraft Possessed	UTE Rate	Sorties Per Month	Sorties Per Year
F-16	12	12	17.8	215	2,574

FY 90 F-16 Sortie Production Program
(Showing proposed varied UTE rates)

Type	Aircraft Assigned	Aircraft Possessed	UTE Rate	Sorties Per Month	Sorties Per Year
F-16	12	12	22.0	264	3,168
F-16	12	12	24.0	288	3,456

Table Nine - Cont.

F-16 Sortie Production Capability Program
(Showing options to achieve parity with past F-5 program)

Type	Aircraft Assigned	Aircraft Possessed	UTE Rate	Sorties Per Month	Sorties Per Year
F-16	16	16	24.0	384	4,608
F-16	18	18	24.0	432	5,184
F-16	20	20	22.0	440	5,280

F-16 Sortie Production Capability Program
(Options varied by PAA and UTE rate to meet MCM 51-50 suggested DACT training goals)

Type	Aircraft Assigned	Aircraft Possessed	UTE Rate	Sorties Per Month	Sorties Per Year
F-16	23	23	22.6	520	6,240
F-16	22	22	23.6	520	6,240
F-16	20	20	26.0	520	6,240

The bottom line in sortie production is that both the number of F-16's available and the currently sustainable UTE rate produce a flying hour program that is substantially smaller than that flown with the F-5. The result of this reduced sortie production capability is an inability to train USAFE fighter aircrews to the level suggested, in MCM 51-50, for Aggressor DACT. The consequence--USAFE fighter aircrews are not being fully trained to defeat the Soviet/Warsaw Pact threat.

Training Scenarios

The current Aggressor F-16 program has flown, on the average, 12 sorties per day in this transition year. To do that, they have, for the most part, flown a two turn day, flying four sorties in each of three goes during the day. While it is certainly possible to fly the same 12 sorties per day in two goes of six aircraft each, the squadron has not done that up to this point in FY 89. That is due in part to requirements for maintenance training, but it is also due to requirements for adversary and Aggressor aircrew training. During the last half of FY 88 and the first half of FY 89, the Aggresssors closed out the F-5 operation, accomplished transition training in the F-16 and began Aggressor operations with the F-16. During that time, the majority of Aggressor air-to-air training was accomplished in scenario sizes of 4v4 or smaller. With the gradual introduction of the F-16 in the first half of FY 89, scenario sizes were largely 2v2 or smaller, as the Aggressors began to gain proficiency in their new jet. Current training, therefore, is just beginning to reach the 4v4 level and should progress to scenarios of larger size over the next few months. Since training with the Aggressors has been very limited in the first half of FY 89, it will take quite a few months for the 527th to begin flying regularly enough with the Soesterburg and Bitburg

F-15 units to bring that large scenario size training up to a level that is comparable with that provided when the 527th had F-5's.

Deployments

With the F-16 aircraft, the 527th made no deployments in the first half of FY 89. In the second half of the fiscal year, they will return to Decimomannau, on a regular basis with four aircraft, to use the Air Combat Maneuvering Instrumentation (ACMI) range for training. While this Decimomannau package is smaller than the one used with the F-5, it will begin to get deployed operations underway and move the 527th along the road to larger scale deployed operations. However, there is one major difference between the F-16 and F-5 programs. While deployed to Decimomannau with the F-16, the 527th will not be able to concurrently deploy a Road Show package. This is due to the size of the flying hour program more than a limitation in aircraft. The current flying hour program envisions a UTE rate of 20.0 for the last six months of FY 89. That equates to 240 sorties per month or 11-12 sorties per available flying day during the month. With only 11-12 sorties available per day, you basically have two choices. The first is to fly all available sorties at Decimomannau and fly none anywhere else. The second is to fly only eight at Decimomannau and

fly the other four at home or at some deployed location on a Road Show. Since it is rather costly in terms of both stretching the maintenance operation and the costs of deploying personnel to another location, the 527th has chosen not to conduct any Road Show deployments during this period. During the last half of FY 89 the squadron will likely maintain a four ship deployment to Decimomannau, flying 8 sorties per day, while the other 3-4 sorties will be flown at home in support of Aggressor upgrade training or against either the Bitburg or Soesterburg units. Scenarios will involve meeting to fight in the area, while flying from their respective bases. The lack of face-to-face briefings/debriefings will surely degrade training to some degree. The bottom line for deployed operations is that unless the 527th can procure more F-16's or increase the UTE rate by a substantial amount, deployed operations will be severely curtailed, and the effectiveness of USAFE DACT training will be degraded, for years to come.

Exercises

Exercise Red Star was last conducted in the last half of FY 87. The exercise planned for FY 88 was cancelled early in the year due to budget constraints, but as it turned out, it would have also been cancelled due to maintenance problems with the F-5. This exercise was

important because of the scenario sizes generated for training the command's F-15 pilots. It was the only exercise in USAFE where F-15 pilots had the chance to fly DACT in scenarios where they were outnumbered by the odds they might actually have to face in combat. From that perspective, it was probably the most valuable air-to-air training exercise in the command and its' elimination has dealt a severe blow to aerial combat training in USAFE. There are other large scale exercises in USAFE, but none in which actual DACT maneuvering can take place. While intercept training in large scale scenarios is good, it is not nearly as beneficial as one in which DACT maneuvering can occur in the same large scale environment. It is also worth noting that exercise Red Flag in Tactical Air Command and exercise Cope Thunder in Pacific Air Forces still provide F-15 and other fighter aircrews in those commands with the opportunity to conduct large scenario size DACT maneuvering fights. F-15 pilots in USAFE, to achieve the same level of DACT training as their TAC and PACAF counterparts, need to fly the same type of large scale DACT maneuvering exercises. Consequently, USAFE must reinstate exercise Red Star as soon as it becomes feasible and practical.

While the Aggressor F-16 transition has enabled the 527th to more accurately simulate the current Soviet and

Warsaw Pact threat aircraft, the small size of the current program has significantly decreased the amount and kind of air-to-air training being provided to USAFE aircrews. It is possible to maintain the size and scope of the Aggressor program at its' current level, but I believe that would be very detrimental to the training of USAFE aircrews. For example, with an annual flying hour program that includes even the 3,000 sorties being discussed for FY 90, that would provide only about 2,800 sorties for DACT training. From Table Eight, we have seen that this number of sorties could provide 16 sorties per pilot to the air-to-air pilots, to the exclusion of all others, or it could provide about 8 sorties for air-to-air pilots if the command chooses to also give a very limited number of Aggressor sorties to air-to-ground aircrews. Even if the air-to-air pilots got the suggested 16 DACT sorties per pilot per year, that is still only 10.7 percent of the 150 total annual sorties the typical F-15/F-16 pilot would get at GCC level B. It is also only a meager 14.3 percent of the 112 air-to-air sorties those same pilots should get every year. While it is certainly worthwhile to introduce the F-16 to Aggressor operations, we must not forget that the Aggressors provide the most realistic, threat oriented aerial combat training and the quantity as well as the quality of the training they provide is important too. USAFE must at least consider ways

to 1) increase both F-16 PAA and UTE rate to provide a total sortie production capability comparable to that flown with the F-5, and 2) improve the efficiency with which it uses the available Aggressor sorties. One of the ways to improve sortie efficiency (that percentage of sorties flown in DACT) is basing.

Basing Options

Just like sortie production capability, any discussion of basing possibilities suggests that something might be wrong with the current basing mode. In my opinion, there are some serious drawbacks to the current location, although I fully realize the reasons Bentwaters was chosen at the time of the move. It is my purpose here to look at some other possible locations that might afford an increased efficiency in the use of the available Aggressor sorties. This section will begin with a look at RAF Bentwaters, but it will also consider some of the other possible locations throughout the command from the persepective of their inherent advantages or disadvantages to support maximum DACT training opportunities. This section is not included to promote any particular location, but rather to examine some of the possible options available before we get so locked into Bentwaters that another move becomes totally impossible. While the data might be available to thoroughly

analyze each of the options, in terms of cost, it is not the purpose of this study to conduct such an analysis.

RAF Bentwaters

It would appear that the Aggressor move to Bentwaters was accomplished as a direct result of the move of two RAF Bentwaters A-10 squadrons to RAF Alconbury during the summer of 1988. It looks as though this decision was based more on available ramp space and base loading than on any consideration for the effectiveness of sortie generation for the Aggressors and their new F-16's. While moving the Aggressors to RAF Bentwaters was probably the least costly of the possible locations, and especially at a time when the command was making the Aggressor transition at their own expense, I would contend that RAF Bentwaters may not be the optimum choice of basing, in the long term, for the 527th. I believe some other locations may offer more benefits to Aggressor operations and Aggressor training of USAFE aircrews.

While a move to RAF Bentwaters offered the immediate availability of squadron operations and maintenance facilities as two A-10 squadron moved to RAF Alconbury, it is of significance that RAF Bentwaters is not an F-16 base. From that perspective, the maintenance and logisitics communities will experience some major challenges in

supporting both the transition and continued out-year operations at RAF Bentwaters. Co-located basing with another F-16 unit would have made the transition and out-year operations easier and less costly from the maintenance and logistics perspectives. By not co-locating the 527th with another F-16 unit, Bentwaters will have to build many F-16 maintenance functions, such as avionics test facilities and an engine shop to name a few. Without building those functions at Bentwaters they would have to ship engines and avionics equipment to another F-16 base for repair, a process that would be very time consuming and inefficient. In addition, having to develop an F-16 supply function and facility at Bentwaters will be costly and inefficient compared to accomplishing that function at a co-located operation.

From the operations perspective, RAF Bentwaters is probably as good as most other locations. A good air-to-air training area is available, and both the Soesterburg and Bitburg F-15 units can meet the Aggressors in that area from their home stations. Ground Control Intercept (GCI) support is readily available and adequate, despite some continual problems in coordinating a Memorandum of Agreement for Operations with the Royal Air Force. One key drawback, however, is the lack of an Air Combat Maneuvering Instrumentation (ACMI) system that covers the airspace. The

ACMI is a complex computerized system that tracks aircraft involved in the scenario and provides a computerized display, at each base, for the purpose of accurately reconstructing and more thoroughly debriefing fighter engagements that take place on each mission. To provide the most effective training from RAF Bentwaters, the planned North Sea ACMI must be completed soon, and once built, USAF units must be given priority, over Royal Air Force and other USAFE units, to accomplish Aggressor training with at least the Bitburg and Soesterburg wings. The capability to downlink debriefing information and a hot line phone system to support debriefings at all three locations is a must. The ACMI would be a big plus for RAF Bentwaters basing, but without it, more effective training might be gained by basing the Aggressors at some other locations in Germany, Spain, Italy or possibly even Morocco.

German Options

There are many possible Aggressor basing locations in Germany, but the most obvious would seem to be Bitburg, where they would be co-located with a unit that gets the most Aggressor training, or at Ramstein or Hahn, where they could take advantage of co-located maintenance operations.

Bitburg offers the advantages of co-located operations (sortie scheduling effectiveness and ease of

providing academics), but it has the disadvantage of airspace areas that are small, subsonic, restricted in use and crowded. Airspace restrictions would both limit scenario size and frequently degrade training effectiveness. The lack of supersonic training airspace would also inhibit training, to some degree. While I do not advocate supersonic airspeeds for all air-to-air training, the time compression problems caused by supersonic airspeeds pre-merge and the inability to effect supersonic separations would unduly degrade training if not practiced at least once in awhile. Lastly, weather is traditionally worse in Central Europe and the number of sorties lost to weather would have a significant impact on the quality and continuity of training. While Bitburg is not an F-16 base, it would at least be significantly closer to one than RAF Bentwaters. Maintenance and logistics operations, while not as smooth as they might be with co-located F-16 basing, would be much easier to support than the cross channel operation at Bentwaters. While basing at Ramstein or Hahn would accrue the benefits of co-located maintenance and logistics operations, the disadvantages, from the operational perspective, of weather and having to fly in small, crowded airspace sectors, would in my mind eliminate them from consideration.

Decimomannau AB, Italy

Decimomannau offers several good aspects for Aggressor training. From the operations standpoint, Decimomannau would be desirable. Airfield facilities and airspace are good, and the availability of ACMI makes this base an attractive option. It would be easy to operate from Decimomannau to conduct training in nearly any scenario size desired, all with ACMI support. Past F-5 operations included more than 3,000 sorties per year at Decimomannau, so the currently envisioned F-16 flying program could probably operate entirely from Decimomannau with little or no change to current operations. However, since Decimomannau is operated on a four nation cost and airspace sharing plan, any significant increase in Aggressor operations at Decimomannau would necessarily require negotiations in cost and airspace utilization sharing.

There are, however, several major drawbacks to operations at Decimomannau. First is base facilities. A permanent relocation to Decimomannau would require an extensive renegotiation of the facilities agreement and a major investment in housing and the associated base facilities require to support a permanent, accompanied tour operation. Maintenance facilities would have to be developed, but probably to n greater extent than they would at any other basing option that doesn't involve co-location.

This could be a good option, assuming USAFE was willing to make the facility improvements necessary and the Italian government, in coordination with the other users of the base (Germany and Britain), would approve such a concept.

Zaragosa AB, Spain

If this option were politically viable, it might be attractive for several reasons. For flying operations, it offers a good airfield and reasonable airspace. Existing base facilities offer good support to a flying operation. The only drawback to airspace use would be getting Spanish government approval for increased use of the air-to-air areas to the northwest of Zaragosa. Existing air-to-air airspace to the South is adequate, but relatively far from the base. Approval for use of the close in areas to the northwest would also offer some increased training opportunities, like Red Flag type exercises, because of the large size of that airspace and its' proximity to existing air-to-ground ranges. In addition, the staff necessary to schedule and conduct large scale training operations and exercises already exists on base.

Maintenance for the F-16's would be more difficult than at a current F-16 base, but building an F-16 support structure for the Aggressors would also benefit other F-16 units that deploy to Zaragosa for other activities.

Weather is good most of the year, and a small base support structure already exists. Such a move might prove to be less costly than many of the other options.

Crotone AB, Italy

With the 401st Tactical Figher Wing move to Crotone, it would seem likely that this base at least be given consideration for basing of the Aggressors. While it would require added costs and Italian government approval, the Aggressor move could piggy-back in many respects on the Torrejon move. From the operations perspective, Crotone would seem to offer good airspace, and the access to Decimomannau would be easy. Co-location with another F-16 unit would offer the obvious maintenance and logistics benefits, and sortie scheduling effectiveness should improve with the parent unit being able to use the locally generated Aggressor sorties. Weather is good, and the 527th could be used to provide base air defense in time of war.

Morocco

If this option were politically feasible, it would also be the most costly. From the operations perspective, Morocco could offer several benefits. Airspace would seem to be good, with few restrictions, and if USAFE sought to do so, air-to-ground ranges and even a Red Flag type operation

could be possible. It would, however, be a costly venture from the standpoint of building base facilities and the maintenance and base support structures to operate there. A Zaragosa style training wing could easily manage daily flying operations and exercise scheduling. While this option is probably prohibitively expensive, we should at least consider it. After all, it was only two years ago that an Aggressor F-16 transtion was also too expensive.

Whatever the basing choice, each offers some advantages and disadvantages. The least costly would surely be to leave the Aggressors at RAF Bentwaters. However, to improve training effectiveness, I see installation of a North Sea ACMI is a must. The next option, in my mind, would be a move to Zaragosa. While expensive, it could offer some increased training opportunities and save some of the essential costs by using existing facilities. Next in line, from my persepctive, would be Crotone or Morocco, although either would be extremely expensive. Last on my preference list would be any German base, primarily due to the bad weather and airspace restrictions. Again, the purpose of this study was not to thoroughly analyze the various 527th basing options. The options have been provided in the interest of showing alternatives to RAF Bentwaters that might increase sortie generation and effectiveness of Aggressor training for USAFE's aircrews.

CHAPTER V

THE FUTURE - RECOMMENDATIONS

The USAFE Aggressor program of the future may very well look much like the program of today. However, it has been the purpose of this study to point out some of the differences between the Aggressor program of today and the one that was conducted with the F-5. Although the F-16 more accurately simulates the current threat aircraft, the F-16 program's limited sortie production capability has caused a 50 percent reduction in the Aggressor DACT being provided to USAFE aircrews. Unless some drastic changes occur in future Aggressor F-16 sortie production capability, the 527th will continue to provide less than 5 percent of the air-to-air training that occurs in USAFE annually. The Aggressors mission is to provide realistic, threat oriented air-to-air training, and without some major changes in the current program, I do not believe they will be able to provide the realistic training needed to teach USAFE aircrews how to meet and defeat the current Soviet/Warsaw Pact threat. The recommendations in this Chapter could make measureable improvements in air-to-air training provided by the USAFE Aggressors. That would make USAFE fighter aircrews better prepared to meet today's Soviet Warsaw Pact threat, and that, after all, is the real reason for doing Aggressor DACT in the first place.

Sortie Production Capability

With the conversion to the F-16, the Aggressors sortie production capability has been severely reduced, from more than 5,200 sorties to less than 2,600 sorties per year. F-16 sortie production capability is a two part problem, too few F-16's (12) and too low a UTE rate (20). An increase in the Aggressor F-16 UTE rate to even 24, higher than any current F-16 unit, would still only produce 3,456 sorties annually. I believe USAFE must work to procure more F-16's for the Aggressor program. It would take 20 jets, flying the standard F-16 UTE rate of 22, just to achieve parity with past F-5 sortie production capability. In fact, to fly enough sorties to meet the MCM 51-50 suggested sortie goals, it would take 22 F-16's flying at a UTE rate of 23.6. Needless to say, we will probably never reach the latter level, but in my opinion, USAFE should continue to procure F-16's for the Aggressors until they at least reach the sortie level achieved with past F-5 operations. While even that level of operations is too low in my opinion, I believe the F-5 sortie production totals offers a fair balance between a much higher level of Aggressor training that I think we should do and the cost of providing that training. I believe that whatever level of Aggressor training is considered, we must remember how it relates to

total air-to-air training in USAFE. Even if you double the current F-16 annual sorties, and provide 5,000 Aggressor DACT sorties per year, that still amounts to only about 10 percent of the air-to-air training being conducted annually by just the command's F-15 and F-16 pilots. While expensive, I believe the training provided by the Aggressors is an essential element to insuring USAFE's ability to successfully meet and defeat the threat.

Training Scenarios

As long as the USAFE Aggressors have only 12 F-16's, the level of scenario size they can provided will always be limited. Unless the USAFE F-15 units were to accomplish nearly all of their 4v4 and smaller DACT scenarios against other USAFE/NATO assets, the Aggressors will never be able to get Aggressor training out of the 4v4 and smaller scenario level of training in order to provide larger, outnumbered scenario size training. One way to coordinate training between USAFE or NATO units would be through some sort of command wide scheduling conference. At that conference, specific time blocks for air-to-air training between the various USAFE/NATO units could be scheduled far enough in advance to allow wings to establish a viable air-to-air training program at the smaller scenario sizes. That would free Aggressor sorties for the more complex scenarios where seeing accurate Soviet formations and tactics, and

fighting outnumbered, becomes more important. I realize that many Wing Directors of Operation (DO) might prefer to fly the small scenarios against the Aggressors, possibly because of the quality of training provided by the Aggressors, but in a time of critically limited Aggressor sortie production capability, I believe Wing Directors of Operations would be better served by using Aggressor sorties in the larger scenarios. Because of regulation restrictions on scenario size with similar aircraft, and overall scenario size limitations with many of the possible adversaries, using Aggressors to fly the larger scenario sizes is really the only way pilots can get this level of air-to-air training. An increase in the number of Aggressor F-16's would also improve the level of training provided by the Aggressors. However, until the Aggressors have several more F-16's, the primary users of Aggressor training will have to accomplish some of the smaller scenario size training against other USAFE/NATO units if they want large scenario size training from the Aggressors.

Deployments

Both the Decimomannau and Road Show Aggressor deployments offered valuable types of training to units throughout USAFE. The F-16 transition has caused deployments to be reduced to only a small package at

Decimomannau. As a result, the units that regularly got Aggressor training from Road Show activities will no longer get Aggressor training. Again, an increase in the number of Aggressor jets would go a long way toward reinstating Aggressor training for units other than Bitburg and Soesterburg. In my opinion, it would take something on the order of 16 jets, flying a 20 UTE rate, just to be able to begin minimum Road Show activities. With this mix, the Aggressors could use 5 jets at Decimomannau to fly 8 sorties per day, 3 jets on a Road Show to fly 4 sorties per day, and still have 2 jets at home to fly 4 sorties a day. While that adds up to only 10 jets scheduled to fly daily, that is consistent with the number of jets that could probably be made available (out of total assigned) for daily flying. The 16 F-16's would also give the Aggressors the ability to fly larger scenarios with more deployed to Decimomannau or in Red Star type exercises at home.

Exercises

Exercise Red Star was a very valuable training exercise, improving the skills of the command's F-15 pilots for fighting outnumbered by the ratios they may actually face in combat in Central Europe. It must be revived as soon as the Aggressors have enough aircraft to conduct it effectively. With only 12 jets, it could still be revived

if the participating F-15 units would accomplish the preparatory, smaller scenario training with other USAFE/NATO units. Whether it be through adding F-16's to the Aggressor Squadron or by getting the F-15 units ready for Red Star in the method described above, I believe this exercise is vital to the command's air-to-air training program.

Basing Options

While it is unlikely the Aggressors will move to another location, at least in the immediate future, I think it is worthwhile to consider some of the possible options. There are some possibilities that could provide better training and more effective utilization of the limited number of Aggressor sorties. There are some alternatives that, although very costly, could add significantly to the overall training of all USAFE aircrews. Probably the least costly of the options, and the one I would recommend now, is to leave the Aggressors at RAF Bentwaters and speed up the installation of the North Sea ACMI.

Summary

We must endeavor to improve the level of air-to-air training provided to USAFE aircrews if we expect them to compete in the current Central European threat environment. The introduction of the sophisticated Mig-25, Mig-29, Mig-31

and Su-27, coupled with the synergistic effect of packaging those aircraft with the Mainstay Airborne Warning and Control aircraft and numerous types of electronic jamming aircraft, have substantially increased the offensive potential of the threat facing USAFE today. The Pact's participation in large scale composite force training indicates their offensive intentions, and their use of massive, coordinated, offensive attacks against Western Europe would be extremely difficult to defeat, particularly with the level of air-to-air training that we are now doing in USAFE. I believe we must invest the money to increase the size of the Aggressor squadron in order to improve both the quantity and quality of air-to-air training in USAFE. While expensive, the cost of providing that training now may well be recovered in the early days of the next air battle in Central Europe. Train like we plan to fight is what we always say, so let's invest now in a commitment to do just that. We have already made the commitment to improve the quality of the threat, simulated by the Aggressors, to one that matches the best aircraft the Soviets now possess. Now we need to make the commitment to generate the quantity of Aggressor F-16 DACT sorties to provide the quantity and complexity of training required to give at least our F-15 and F-16 pilots the skills and confidence to fight outnumbered and win. In this evolutionary F-16 transition,

as opportunities arise, we also need to reassess our Aggressor basing strategy so we can maximize airspace availability, minimize maintenance and operations costs, and always keep our eye focused on enhancements which improve the quality of missions and learning. Our ability to beat the Soviets in a central European air battle today is based on a qualitative lead in aircraft technology and the training of our pilots. As the Soviets continue to close the technology gap, we must seek every opportunity to improve both the quantity and quality of USAFE air-to-air training.

NOTES

1. Lt Col Robert W. Mendell, USAF, "USAFE Aggressors For the Future," (Washington, National War College, 1984), p. 3-4.

2. Ibid., p. 4-5.

3. Ibid., p. 5.

4. Ibid., p. 5.

5. Ibid., p. 6.

6. Gaston Botquin, "Aggressors", L'Aviation Magazine, February 1982, p. 31

7. Mendel, p. 6.

8. Malcolm English, "Air Combat-Eagle Versus Aggressor," Air Pictorial, February 1983, p. 48.

9. Roger Lindsey, "Alconbury Aggressors," Aircraft Illustrated, September 1982, p. 413.

10. Mendel, p. 10.

11. Tactical Air Command. TAC Manual 51-50, Vol 1: Tactical Fighter/Reconnaissance Aircrew Training. USAFE Chapter 6, APO New York 09094-5001 : HQ USAFE/DOOT, 17 May 1988, p 18.

12. Ibid, p. A-1-3.

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